

distance of the optical system and essentially is the distance from the plane of Fresnel lens 21 to the plane of the display image on the face of cathode ray tube 11. The distance S_2 is the image distance from the plane of Fresnel lens 21 to the magnified image developed by such lens. By conventional definition, and since the distance S_2 has a negative value in the FIG. 4 optics system, the enlarged image as viewed from point 55 for instance is at the plane designated 56 and is a virtual image. The degree of magnification (M) obtained in the FIG. 4 optics arrangement is conventionally expressed as the ratio of the absolute values of S_2 to S_1 . Also by definition the inverse of the focal length f_L of the FIG. 4 optical arrangement is $1/S_1 + 1/S_2$. Further by definition, the f number of the FIG. 4 optics arrangement is f_N and is equal to f_L/D , where D is the lens diameter. Since in most applications of this invention Fresnel lens 21 is of elongated rectangular configuration the dimensional of the lens included diagonal is considered to be the lens diameter D . Also it should be noted that the type of display device illustrated in FIGS. 2 through 4 (cathode ray tube) has a spherical display surface. It therefore becomes desirable that Fresnel lens 21 be constructed as an aspherical magnifying device to thus compensate for optical aberrations and distortions that otherwise would occur.

An important point to be noted with respect to FIG. 4 is that the limits of the virtual image in plane 56 extends substantially beyond the limits of the image display area 57 on the face of device 11 and of cathode ray tube 11. A region or zone is thereby made available for installing support structure for device 11 without interfering with formation of the magnified virtual image. FIG. 5 illustrates schematically and in greater detail the method of installing vertically abutting supports or housings 17 for devices 13 and 16 of FIG. 3 within the available support space. The zone 58 illustrated in FIG. 5 and shaded by appropriate diagonal lines may also be used for support or allied purposes since the presence of structure there will not interfere with the virtual images appearing at aligned plane 56. The same support technique may be used in connection with the lateral (horizontal) separation of objective image modules that occurs in the arrangement of display modules in array 10.

FIGS. 6 and 7 are provided in the drawings to illustrate the form relationships that exist as between the images displayed on arrays 10 and 20 in accordance with this invention. FIG. 6 illustrates a total image 60 as viewed on magnifying lens array 20 from positions within the FIG. 2 and FIG. 3 theater spaces. Total image 60 is comprised of individual image modules 61 through 66 abutted along lines 67 through 69. Lines 67 and 68 are the lines of vertical abutment between Fresnel lenses 21 through 26 and line 69 is the line of horizontal abutment of lenses in array 20. The diagonal line elements 70 through 93 comprise total image 60. Those individual line elements comprising each one of separate image modules 61 through 66 are separately numbered for the different lenses shown in FIG. 6. The actual width dimension of total image 60 as optically magnified and viewed is designated W and the over-all height dimension of the array of optically magnified image modules 61 through 66 is designated H . Since arrays 10 and 20 are preferably comprised of modules of uniform size, and since the illustrated FIG. 6 array 20 is comprised of three image/lens modules in a hori-

zontal direction and two image/lens modules in an elevational sense, each individual lens module in array 20 has a width dimension of $W/3$ and a height dimension of $H/2$.

FIG. 7 is similar to FIG. 6 but is an elevational view of image generator device array 10 as observed from between arrays 10 and 20. The support element and cathode ray tube element portions of array 10 have the same reference numerals 11 through 17 as in FIG. 1. However, the objective images which are displayed on array 10 are separately designated 101 through 106, respectively, and each essentially corresponds in extent to the cathode ray tube image display area 57 limits of FIG. 5. Each such objective image is comprised of an interior unique area designated 108 and a surrounding parallax compensation or overlap area 109. The unique area 108 and surrounding parallax compensation or overlap area 109 comprise the total area of each displayed objective image module.

The interior unique area portion 108 of each objective image contains the original image diagonal line elements of the optically aligned image module in FIG. 6 in their form and size prior to optical magnification by an appropriate one of Fresnel lens 21 through 26. The surrounding overlap 109 contains duplicate or overlap portions of the original image diagonal line elements in each adjacent or abutting image module. FIG. 7 also provides dimensional information regarding the invention beyond that disclosed in FIG. 6. As shown, each module in image generator array 10 has an over-all width dimension of A and an over-all height dimension of B . Such A and B dimensions correspond to the modular dimensions $W/3$ and $H/2$ illustrated in FIG. 6, respectively, and also define the over-all width and height dimensions of each typical support or housing 17. Further, the dimension A corresponds to the horizontal center-to-center distance between adjacent objective image modules displayed in array 10.

Schematically outlined cathode ray tubes 11 through 16 of FIG. 7 are normally of standard construction in all respects. The illustrated FIG. 7 dimensions C and D for each such image generator are the over-all dimensions for each included image module 101, 102, etc. Dimension C is normally approximately 0.9 dimension A . The dimension D in a conventional cathode ray tube display is normally approximately 0.7 the value of dimension A . With respect to the image unique area provided in each image module, dimensions E and F are typically 0.7 and 0.5 the value of dimension A , respectively. Accordingly, the width of the parallax compensation margin or overlap area 109 which surrounds each image unique area 108 is normally 0.1 the value of dimension A .

Although the foregoing objective image module dimensional information pertaining to unique areas and overlap areas is expressed in relation to a finite dimension such as the width of the magnified original image displayed in area 20 (A , W/n , a technical analysis and derivation for such dimensional information does exist. Specifically, the total image overlap, in percent, for both sides of an image module (the percentage ratio of the dimension C minus dimension E divided by dimension C , or dimension D less dimension F divided by dimension D , FIG. 7) equals